

***ASPIRA MATH AND SCIENCE ACADEMY (MAS)
A PROPOSAL TO PARTICIPATING LOCAL DISTRICTS***

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ASPIRA Math and Science (MAS)

A Proposal to The Participating Local Districts

EVIDENCE OF PROJECT NEED

America's Future Competitiveness at Risk Today

Throughout the world, the United States is considered a leading innovator, indeed, a pioneer, in high-technology research and development. According to the Bureau of Labor Statistics, by the year 2005 over 1.6 million people will be employed in the United States as engineers, compared with 1.3 million in 1992. Growth is expected to continue in computer-based professions, including programmers, scientists and systems analysts. The number of jobs in these fields will increase by twenty five percent from 1.2 million in 1992 to 1.5 million in 2005.

The Bureau predicts that career opportunities also will dramatically improve for scientists and mathematicians — especially those in the field of applied mathematics — and in the related areas of physics, economics, business, industrial management and statistics. However, while these statistics paint a promising picture of economic growth, it is important that the country be in a position to take advantage of this opportunity, by shaping the existing educational system into one that is capable to meeting the output demand needed for a high quality labor force.

Clearly, there is a current need for the *education* of a technical workforce today for the next century. According to a recent report to the President on *The Use of Technology to Strengthen K-12 Education in the United States*, we are engaged in an era of increasing international and economic competition in which the quality of America's pre-college schools could determine whether our children will hold highly compensated, high-skill jobs that add significant value within the integrated global economy of the twenty-first century. "The danger of [this] scenario lies not only in its potential effect on our country's aggregate national income, but the potential for unprecedented (at least within the American experience) disparities in income among Americans that could threaten the political stability our nation has long enjoyed." (Committee of Advisors on Science and Technology, Panel on Educational Technology, March 1997).

The low participation rates of underrepresented groups in science, engineering and math is problematic. To combat this epidemic underrepresentation, Congress has required the federal government to make a concerted effort to increase opportunities for underrepresented racial groups in math, science and engineering fields. Congress expressly presented its position in the *Science and Engineering Equal Opportunities Act* which states in part that it is the nation's policy to encourage men and women equally, of all backgrounds, to acquire skills in these areas. The purpose in encouraging participation across all races and ethnicities, as stated by the Act, is to make "full use of the human resources of the nation in science and engineering."

There is a demonstrable need in increasing the number of skilled workers in the science, mathematics, engineering and technology fields. There also are great deficiencies in systemic efforts directed towards increasing the number of minorities in the same fields. In order to meet this need, we must consider *every* student population as having the potential to meet this goal. The arch of opportunity needs to be extended to a growing young minority population.

Hispanics are the fastest growing and youngest of all minority populations. By the year 2030 they will constitute the largest minority group (and the majority group in 10 of the 25 largest school districts) in the country. In the cities served by ASPIRA, Hispanics are very close to constituting a majority in urban school districts. Also, in the schools served by ASPIRA, Hispanics make up an overwhelming majority of the student population.

Fortunately, the proportion of Hispanic students entering college has increased in the past ten years. Unfortunately, the vast majority of Hispanic students (over 65 percent) attend two-year institutions and do not transfer to four year colleges which offer math and science-related careers. The numbers of Hispanic students entering mathematics, science and engineering remains below 5 percent. This is a disconcerting figure considering that Hispanics represent 10 percent of the total United States population.

In 1994, the dropout rate for Hispanics between the ages of sixteen and twenty-four was close to 40 percent (meaning they had not completed high school and were not currently enrolled in regular or adult high school classes). The comparable dropout figures for Whites and African Americans were 10 and 18 percent respectively. The exceedingly high dropout rate among Hispanic students is a most serious challenge. In a high school with a 95 percent Hispanic student body in Philadelphia, for example, of the 320 freshmen who entered the 9th grade only 30 graduated four years later.

As data show improvement in academic achievement among African American students, Hispanics — for whom English is often a second language — still lag far behind all minority groups (with the exception of Native Americans) on *every* measure of academic achievement and school retention. Over the past decade, there has been little improvement in the retention, achievement, and promotion rates of Hispanic students.

Addressing the problem of low minority participation in science and math-related fields requires some understanding of the reasons *why* few underrepresented minorities choose math, science, and engineering as their course of study and career to begin with. While there are undoubtedly many causes, we highlight the following:

- **Low Participation in Challenging, Pre-College Math and Science Courses.** While African American and Hispanic high school students are about as likely as White students to take biology, they are far less likely to take chemistry or physics, according to the National Education Longitudinal Study Transcripts. In math, 75 percent of all White 8th graders in the country perform at or above the basic achievement level, while only 37 percent of Latino students reach this level. Latino students also take key “gatekeeper” courses, such as algebra and geometry, at significantly lower rates than White students. A recent analysis by the U.S. Department of Education indicates that high school students who take algebra, geometry and other rigorous mathematics courses are more likely to go on to college, regardless of family income. The study also suggested as one of the next steps to remedy this situation is to have educators, policymakers and community members support mathematics achievement outside the classroom through math clubs, tutoring, and job shadowing. (*Mathematics Equals Opportunity*, A White Paper Prepared for Secretary Riley, U.S. Department of Education, October, 1997).

- **Low Attainment Rates in Math and Science.** The President's Advisory Commission on Educational Excellence for Hispanic Americans 1996 report, *Our Nation on the Fault Line: Hispanic American Education*, the National Science Board's statistics and several other studies clearly show that minorities — especially Latinos — have low attainment and achievement rates in science, mathematics and technology (SMT), and even lower employment rates in these fields.
- **Lack of Parental and Community Support.** The research also clearly demonstrates that parent involvement in SMT education of their children is a key factor in student success and that community support is essential to successfully implementing systemic SMT reform. Students whose parents are involved in their school work are more likely to take challenging mathematics courses early than those students whose parents are not involved. Students, parents, and counselors alike need to understand the importance of students' early study of math and science. (*Mathematics Equals Opportunity*, A White Paper Prepared for Secretary Riley, U.S. Department of Education, October, 1997).
- **Unequal Access to Technology.** Today, significant differences in computer resources are still existent between schools. The student-computer ratio — which varies according to socioeconomic level, geographic location, school size, and other variables — shows its largest discrepancies (aside from socioeconomic level) in middle schools with large minority populations. Schools with less than 4 percent minority enrollments have an average of 14 students per computer, while schools with more than 24 percent minority enrollments have 18 students per computer. This discrepancy is even higher at home where Hispanic students are 59 percent less likely than Whites to have access to a computer. (Office of Technology Assessment, *Teachers and Technology: Making the Connection*, 1995).
- **Unequal Access to Educational Resources.** Author Jonathan Kozol and others have documented how children from poor urban or rural neighborhoods are often schooled in buildings that are structurally unsafe, unhealthy and poorly equipped. These scholars are underfunded and have a greater percentage of teachers untrained in their field. For good reasons, these children find it difficult to compete with their suburban cohorts.
- **Lack of Prepared and Qualified Teachers.** Teachers also need to have appropriate access to technology, professional development, and educational resources. They need to break down the isolation that traditionally plagues their profession by creating new avenues of acquiring and sharing information, insights and practices. Specifically, teachers need to understand how to use new technologies efficiently in their educational practices. (*Achieving the Goals – Goal 5: First in the World in Math and Science Technology Resources*, U.S. Department of Education, 1996).
- **Lack of Financial Support.** Many students from underrepresented groups simply cannot afford the investment in long college careers. With government assistance shrinking, schools that used to provide affordable education alternatives — such as Historically Black Colleges and Universities — are becoming out of reach.

In a recent series of interviews with the periodical *Hispanic Outlook in Higher Education*, Hispanic students confirmed that these were some of the major obstacles for them to overcome in their pursuit of opportunities in science, engineering and mathematics fields and graduate study.

In addition to challenges at an individual level, educational systems face their own challenges in educating a skilled workforce. These challenges are best explained through the *Triple Challenge*. The Triple Challenge is one of: 1) Full and Equitable Access; 2) Education for the 21st Century; and 3) Responding to Austerity. Full and equitable access means reaching to a growing student population across distance, location, language, learning style, disability, limited personal time and fear (of education and technology bred by former experiences) to provide access to information and new educational strategies.

Education for the 21st century implies that today's educational systems must provide their students with the kinds of higher order skills of thought and action needed to live and be successful in the next century. These skills include proficient use of technology; ability to work in, form, and lead teams; ability to identify what needs to be learned and then efficiently learn it. Responding to austerity indicates a need to educate growing populations and increasing the percentage of monies invested in technology with stagnant or diminishing resources (Stephen C. Ehrman, Annenberg/CPB Projects, *Learner Online* <http://www.learner.org>).

Technology, however, is only a tool. The response to the Triple Challenge is determined by the ways students, educators, and policy makers use the opportunities that technology provides and by the way they cope with its weaknesses. Supplying the technologies, therefore, is the beginning, not the end, of dealing with the Triple Challenge.

As listed above, the prevailing barriers towards minority participation in SMT fields are, amongst others: low participation in challenging & motivating math/science courses, low attainment rates in math/science, lack of parental and community support, unequal access to technology, unequal access to educational resources, lack of prepared and qualified teachers, and lack of financial support.

However, to stay competitive as a nation, we need to recognize the demographic changes and the ethnic composition of our population and ensure that all ethnic groups receive a world-class education. As the youngest and fastest growing section of United States population, Latinos have the potential to become major players in fulfilling the need for trained human resources in the future. Moreover, their science, mathematics, and technology (SMT) literacy will be crucial in a century that will be dominated by technology.

ORGANIZATIONAL BACKGROUND

ASPIRA of New Jersey has extensive experience and capabilities to implement the expansion of the MAS Academy activities into middle schools in selected local school districts in New Jersey. ASPIRA of New Jersey has extensive experience in working in local communities: 1998 marks the 30th anniversary of the ASPIRA efforts in New Jersey.

ASPIRA of New Jersey has been an effective advocate for Latino children working in Newark, Jersey City, Trenton, Paterson and Camden fostering optimal conditions for educational success of all children. The overall effectiveness of ASPIRA of New Jersey can be gauged by the progress of its alumni. To date, ASPIRA of New Jersey can proudly attest to having helped over 30,000 Latino men and women - many of whom are today in significant positions of leadership in the private and public sectors. Their achievements are testaments to both their struggles, and ASPIRA's firm belief embodied in all our programs: that Latino youth can and do succeed when provided with the appropriate support and guidance.

Current programs being operated by ASPIRA in New Jersey include, but are not limited to the following:

ASPIRA Parents for Educational Excellence (APEX) - APEX uses a series of proven strategies of outreach, recruitment, retention, and training methodologies to address such topics as helping children improve their study habits, communications skills for the home, parental rights in the schools, school structure, self-esteem, group dynamics and parent leadership skills.

National Health Careers Program - Provides a comprehensive range of support services designed to address specific academic, motivational and counseling needs of students who are interested in careers in the medical and health fields.

The ASPIRA Public Policy Leadership Program - Provides high school students with the opportunity to study public policy and work with local leaders in community service internships for a full year. Selected students participate in a National Fellowship Program, spending the summer in Washington, D.C. as National Fellows.

The Talent Search Program - a core ASPIRA program funded by the U.S. Department of Education, targets first generation college-bound students who demonstrate a potential to succeed. Talent Search counselors provide information to these talented students on opportunities in higher education, assist with applications for admissions and financial aid, as well as assist with ACT and SAT preparation.

The ASPIRACorps (ASPIRA/Americorps) Community Service Program - Supports volunteers who spend a year tutoring and mentoring middle and high school students, and working to bring families together in after-school activities.

PROJECT DESCRIPTION AND OUTLINE

ASPIRA of New Jersey strongly believes that only collaborative projects with the full support of the local schools districts can bring true solutions to the current status quo. The local districts must "buy in" both financially and in terms of moral and programmatic support if we are to succeed in this unique collaborative endeavor.

The ASPIRA/Local School Districts/ Solution: The MAS Academy

I. The MAS Academy

MAS stands for *Math And Science* but MAS also means *more* in Spanish. More is precisely what ASPIRA believes; that all of our children should have more access to an excellent education in SMT and to the adequate academic conditions they deserve. The life of each of these students needs to be enriched through the MAS Academy to achieve improved SMT education.

The MAS Academy model was developed through a three-year grant from the Carnegie Corporation of New York and piloted in Chicago and Miami. At each site, the program served 100 seventh and eighth grade students each year. In Chicago, the MAS Academy collaborated with the Jose De Diego and Prescott Middle Schools. In Florida, it currently operates at ASPIRA of Florida's alternative middle school, Accolade. At both sites the program has served low-income Latino and other minority students from inner-city neighborhoods.

The purpose of the MAS Academy is three-fold:

- To increase Latino representation in science and math-related careers;
- To increase student motivation and interest in math and science; and
- To increase the Math and Science literacy of Latino youth.

The MAS Academy offers cohorts of 100 pre-college students in each of the cities where it operates a series of hands-on academic enrichment activities and support during the summer and academic year. Moreover, the program develops and builds upon collaborations with museums, scientific organizations, and educational systems to enhance student access to a broad range of community mathematics and science resources.

In New Jersey, the MAS Academy will operate with the collaboration of a minimum of five local school districts which will "buy in" their participation. Each local district will contribute financially to support an Academy "chapter" of twenty students at a middle school selected by the district. The choice will also be given to each district to extend MAS to 9th and 10th graders, based on a larger financial contribution.

Goals of the ASPIRA MAS Academy

The Goals of the ASPIRA MAS Academy are as follows:

- To assist in closing the gap in science and math participation between Hispanic and non-Hispanic students by offering an intensive, academic-year and summer mathematics and science enrichment program that supplements regular course work;
- To increase student awareness in science, mathematics, engineering and technology as career options, enhance their motivation to complete rigorous science and mathematics course work in high school, and to pursue math and science-related fields in college;
- To empower parents of Hispanic students to become advocates for their children's academic success in science, mathematics, engineering and technology — especially by increasing awareness of parents in these fields and helping them to promote SMT involvement with their children at home;
- To increase the involvement of community-based organizations, especially those with strong ties to the Hispanic communities and educational & scientific institutions serving Latino students, in order to create partnerships in support of educational initiatives in SMT for minority students; and
- To demonstrate and encourage replication & adoption of this model in schools and communities with large Hispanic student populations across the country.

Key Components of the ASPIRA MAS Academy

The MAS Academy combines five key components aimed at enriching the regular coursework of students in math and science, building the students' interest and aspiration to pursue a SMT career, and increasing the awareness, education, and support of those around them. The key components are described below.

- **Academic Enrichment and Support through the Academic Year.** Students participate in a host of highly motivating, hands-on mathematics and science experiences designed by math & science educators and led by teachers. The students meet at least two hours per week with teachers, tutors, or professionals as "role models" to receive assistance with homework and acquire new academic skills in math and science. Students also receive information and are made aware of the requirements and steps necessary to pursue careers in science and math-related fields.
- **Summer Enrichment Program.** Four to six-week, daily summer sessions that include experiential hands-on and extra-curricular learning activities in mathematics and science, problem-solving exercises, and field trips to Science Museums, Universities, or other places of SMT interest.
- **Counselor, Coordinator, Tutor Awareness and Training.** Sessions are held for counselor, coordinator, and tutors to increase their awareness and understanding of the importance of SMT education. The sessions will also focus on educating the counselors on SMT reform.

- **Parent Awareness and Support.** Sessions are held for parents focusing on building a partnership within the family that reinforces academic growth and achievement and which encourages parents to become advocates for their child's academic development in mathematics and science.

Methods for the MAS Academy

The following methods will be used for the accomplishment of the MAS Academy:

Academic Enrichment and Support through the Academic Year

Participants in the MAS Academy will meet for at least two hours every week to participate in enrichment activities throughout the year in various SMT activities including:

- Tutoring in math and science by teachers and/or graduate students pursuing a degree in math or science education. Students will be tutored on particular areas of difficulty they are experiencing or on individual projects such as science fair projects.
- Group experiential learning through hands-on activities prepared by NSTA (National Science Teachers Association), NCTM (National Council of Teachers in Mathematics) NASA, ETS (Educational Testing Service), NSF (National Science Foundation), or other similar institutions committed to SMT education.
- Career Day in which participants will take a closer look at what scientists and mathematicians do in real life through a series of short video productions presenting a variety of minority scientists in dozens of fields explaining their profession and the relevance of science education.
- Ask-A-Scientist Day to follow Career Day in which scientists come into the classroom as role models to present a real life discussion on particular questions the participants may have on science, mathematics, engineering, or technology.
- Visit to relevant scientific institutions, such as the Liberty Science Center in NJ which has various hands-on science exhibits for youth, the New York Hall of Science (with 185 hands-on science exhibits), The Panasonic Learning Lab, or other institutions with similar missions.
- Access to the Internet through visits to CASA MAS.

Summer Enrichment Program

The summer program will be primarily composed of intensive, all-day, hands-on science and math activities. The MAS Academy will be held every weekday and run for four to six weeks and will include field trips and events similar to those throughout the year.

Through the Summer MAS Academy, students have been intensively involved in the discovery of Science. Among the activities and materials that will be used in the Summer MAS Academy are materials developed by ASPIRA on topics such as Biology (the cell, bacteria, digestion, excretion, photosynthesis, the plant kingdom), Genetics (inheritance and chance, DNA), Physical Science

(viscosity, chromatography, pH, density, gas and volume, surface tension), Physics (light and electricity, conductors, static electricity, circuits, magnetism), General Science (weather, measurement, estimation), Earth/Environmental Sciences (the solar system, planetary motion, populations), and Math (algebra, arithmetic, percentages, square roots, geometry). All the activities mentioned above are hands-on, foster group learning, and are of interest to students involving them in a journey of self-discovery.

The summer allows for time to visit scientific research institutions, trips to museums, and other activities where students could learn at their own pace and about their own interests. The Summer MAS Academy begins with an Opening Ceremony where parents, students and teachers can meet to talk about general issues, answer questions, dispel any anxieties about math and science, and discuss activities to come. This informal activity is an excellent initial opportunity for parents to become participants in their children's education. The end of the Summer MAS Academy is marked by a Closing Ceremony where parents, teachers and students once again meet and share the success and experiences of the program. Students receive a certificate of completion and are informed of the MAS Academy activities for the Fall.

Coordinator, Counselor, and Tutor Awareness and Training

It is essential for the success of the program for those who are working in close contact with the students and parents to be aware of the importance of SMT education methods and reform initiatives. It is of particular importance for counselors and coordinators to be aware of the overall objectives of SMT educational reform so that they may easily, intelligently, and in simple language be able to explain the importance or answer questions on SMT educational reform to parents and students alike. Increased awareness in these areas also allows for the counselors and coordinators to obtain a good grasp into the major objectives of SMT educational reform.

Counselors, Coordinator, and Tutors will be trained with the following materials to be acquired from The Annenberg/CPB Math and Science Collection (except where noted):

Can we Change? Yes, But (Annenberg/CPB)

An easy-to-understand yet thorough brochure for parents, educators, administrators and members of the community who aren't aware or convinced that we need to change the mathematics we teach and how we teach it. It explains the gap between schools today and what will be expected of students as adults in tomorrow's world.

Restructuring Mathematics: Making Change (Annenberg/CPB)

This video is proof positive that innovations in math education help energize and enrich the entire school culture. It shows how hands-on, collaborative learning and problem-solving help students manage the personal and job responsibilities of the adult world.

Creating a Climate for Change...Math Leads the Way (Annenberg/CPB)

Six Workshops that enable the audience to focus on a core issues surrounding educational change: Change as a Process, Moving from Memorizing to Problem-Solving, Learning to Work in Collaboration with Others, Teaching to Reach other Students, Data and Decision-Making, and Involving the Community in Change.

BreakThrough: The Changing Face of Science In America (Blackside, Inc)

Profiles of 20 contemporary African-American, Latino, and Native-American scientists who are making advances in a variety scientific disciplines. The scientists also tell stories of support and encouragement they received from their families and communities. As a result, many are actively engaged in programs to help students of color experience the wonders of science in hopes of further increasing the diversity of America's scientific community.

SETQuest (COMAP)

Encourages young people and adults to explore a wide range of career opportunities in science, engineering and technology. Through the video, viewers can spend a day on the job with a group of professionals and experience the challenges and requirements of their work. Many minority scientists are presented through thirty presentations.

In addition to the above, the coordinator, counselor, and tutor will also be trained on the effective use of the Internet. The details of this training and its effects are discussed below under *CASA MAS Access*.

Funds to purchase the above listed materials have been included in the proposed budget. The National Program Manager will be available and accessible to answer any questions throughout the training of the staff.

Parent Awareness and Support

A key component of the MAS Academy is its involvement with parents in creating awareness and support of their children's SMT education. A series of workshops will be offered for parents using the *strategies and methods* of ASPIRA's Parents for Educational Excellence (APEX) Program. APEX uses a series of proven strategies of outreach, recruitment, retention, and training methodologies to address such topics as helping children improve their study habits, communication skills for the home, parents' rights in the schools, school structure, self esteem in parents and children, group dynamics, and parent leadership skills. To date, APEX has been successful in educating over 1,000 Hispanic, inner-city, low-income parents.

The APEX Program has had a great effect on many of its participants. Parents who have participated in the APEX Program report that they have become more involved in their children's education in a variety of ways: from simply creating a quiet space at home for their children to study to campaigning and becoming elected to a local school council. In fact, one outstanding result of the training during the first year of the APEX Program was the election of ten APEX parents in Chicago to positions on local school councils, Chapter One committees, and school bilingual committees. It is precisely this type of parent involvement that strategies of the APEX Program were designed to achieve.

The ASPIRA MAS Academy will build on the existing strategies, methods, and community experience of the APEX program to increase parent awareness and support in math and science. The Partners for Reform in Science and Math (PRISM) Parent Outreach Kit, created specifically for minority urban populations, will be used as the curricular guide for the training sessions.

Through PRISM, ASPIRA's Parent Support Counselor will expose parents to training sessions that focus on increasing awareness on the importance of math and science involvement with their children. Parents will also receive one extra workshop in addition to the PRISM sessions describing the World Wide Web and the resources available to them through CASA MAS. Through this workshop, the Parent Support Counselor will announce his/her availability and commitment towards helping parents access and make use of the resources available through CASA MAS and the web.

The relation between APEX and PRISM is clear in that they are supportive of each other. One builds on the relationship within the family & the school (APEX) and the other motivates parents to be involved with their child in math and science (PRISM). Therefore, those parents who are interested will also be invited to attend APEX workshops.

Overall, fifty parents will be trained through the PRISM workshops. The parents will be recruited from two cohorts: 1) The parents of participants at MAS Academy of New Jersey, and 2) Other Latino parents currently participating in the APEX program in New Jersey who desire to learn more about involvement with their children in science and math. For the creation of the first cohort, all parents of the MAS Academy's student participants (there will be 100 student participants in New Jersey's MAS Academy) will be invited to the PRISM sessions. We expect recruit and train at least 35 parents from this group. For the creation of the second cohort, fifty of the parents currently undergoing APEX training will be invited to the PRISM sessions. We expect recruit and train at least 15 parents from this group. At the end of the project, these two cohorts will contribute to the training of at least fifty parents through the PRISM workshops. Parent awareness and support sessions will be conducted in English or Spanish, as necessary, by ASPIRA's bilingual Parent Support Counselor.

At the end of their training, parents will receive a certificate of completion and a complimentary set of *Math News* (parent activities to help the child learn problem-solving and critical thinking skills, available through the Annenberg/CPB Math and Science Collection). Facilitators will also promote the use of *Family Math* and *Family Science* (hands-on activities for adults and children in a family to enjoy doing math and science together, available through UC Berkeley's Lawrence Hall of Science) by making them accessible in English or Spanish to parents who are interested in exploring additional activities with their children.

In addition to administering the awareness and support sessions in math and science, the Parent Support Counselor will also: i) Aid parents who are procuring parent support information (especially in SMT) through use of the Internet's CASA MAS and other resources, ii) Facilitate communication between local school administrators, teachers, and parents by introducing them to the short and long term benefits of the APEX and PRISM curricula, iii) Aid students who are procuring financial aid information on SMT higher education through use of the Internet's CASA MAS and other resources, iv) Act as a liaison between local colleges and university admissions offices, financial aid, student visits to campus sponsored by these institutions and math/science/engineering departments, v) Attend PTA Meetings, especially those in relation to Math and Science Issues, and present information about project activities to involved parents, and vi) Meet with representatives from other community based organizations to increase collaborative efforts in the area of parental involvement in Math and Science education.

PROJECT TIMELINE

The proposed project would be comprised of two yearly phases and its timeline is shown below:

YEAR	1998				1999				2000			
QUARTER	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
PHASE	I		I	I	I	I/II	II	II	II	II		
MAS ACADEMY												
Staff Training		X										
Academic and												
Summer Programs			X	X	X	X	X	X				
Parent Training			X	X	X	X	X	X				
EVALUATION												
MAS Academy				X		X		X				
Annual Report						X				X		
DISSEMINATION												
Newsletter		X		X		X		X		X		
Local Visits												
& Meetings					X	X		X				

EVIDENCE OF PROJECT VALUE

Meeting the Needs

The ASPIRA MAS Academy will provide added value and further the goal of SMT education by:

- Providing interesting, hands-on mathematics and science experiences through the year and summer to pre-college minority students.
- Increasing student awareness in math and science careers and provide access to minority role-models in math and science.
- Increasing parent awareness and support in SMT education and reform and providing them with adequate resources to promote their involvement in SMT education at home.
- Providing teachers with adequate access to educational materials and training in SMT education.
- Increasing awareness of SMT education and reform in those who are in close contact with the parent and student such as teachers, counselors, and coordinators.

At the conclusion of the project the following *Measurable Results* will be attained:

- By the end of the project, the Mathematics and Science (MAS) Academy will be in operation in ASPIRA of New Jersey expanding its comprehensive, year-round, model mathematics and science intervention program for middle school s Latino students in this state.
- By the end of the project, the New Jersey MAS Academy will have provided 100 seventh or eighth grade Latino students with science and math enrichment activities.
- By the end of the project at least fifty parents will be educated through PRISM to increase their awareness of SMT education and reform at the New Jersey MAS Academy.
- By the end of the project, the New Jersey MAS Academy will positively improve the attitudes towards science and math learning of participating students by 25 percent.
- By the end of the project, the New Jersey MAS Academy will improve by 75 percent the knowledge of participating students of the jobs and careers opportunities in science and math;
- Nine teachers will be trained through programs created exclusively for training educators in the use of technology in a minimum of three MAS Academy sites by 1999.

The Principal Investigator will report the above results to the Local School Districts. Compliance with the above measurable objectives will be an integral component of the project summative evaluation strategy.

PROJECT EVALUATION PLAN

The project evaluation will consist of both formative and summative evaluation through two annual reports. With the support from the Carnegie Corporation of New York, the Center for Talent Development at Northwestern University has developed instruments specifically for use in the evaluation of the ASPIRA MAS Academy. We are currently enhancing our data collection and analysis mechanisms.

The instruments developed by Center for Talent Development at Northwestern University will be used as baseline information regarding the state of attitudes, understanding and support towards science and math teaching and learning by students, teachers and staff. This baseline data will serve as a point of comparison to evaluate the accomplishment of the project proposed measurable objectives.

The evaluations will be based on the accomplishment of the project *Measurable Results* as listed above. The evaluation strategy will focus on three aspects: a) the success of the science enrichment activities - the number and characteristics of students served; b) the impact of the activities and materials on student awareness and involvement determined through student perceptions and actual motivational changes as a consequence of exposure to the program; c) the success of the program's parent and staff training initiatives. The proposed evaluation strategy and its relation to the project objectives, outcomes, and evaluation criteria is presented in the following table.

OBJECTIVES, EXPECTED OUTCOMES, AND EVALUATION CRITERIA FOR THE ASPIRA MAS PROJECT

PROJECT OBJECTIVE	EXPECTED OUTCOME	EVALUATION CRITERIA	REPORTING
M A S A C A D E M I C	Academic Year & Summer Enrichment Program -Serve 100 7 th and 8 th Graders -Increase attitude towards SMT by 25% -Increase knowledge of SMT Careers by 75%	-Completion of Program Activities -Enrollment & Center for Talent Development (CTD) Evaluation Forms	Annual Report Persons in charge: Coordinator Teachers, Tutors
	Counselor, Coordinator, Teacher Training -Increased awareness on the importance of SMT education and reform	-Completion of Training & CTD Evaluation Forms	Annual Report Persons in charge: Program Mgr.
	Parent Awareness And Support At least fifty parents will be educated through PRISM on the importance of math and science education for their child	-Completion of Program -CTD Evaluation Form	Annual Report Persons in charge: Coordinator, Parent Support Counselor